

Introduction to Functions

Vending Machines

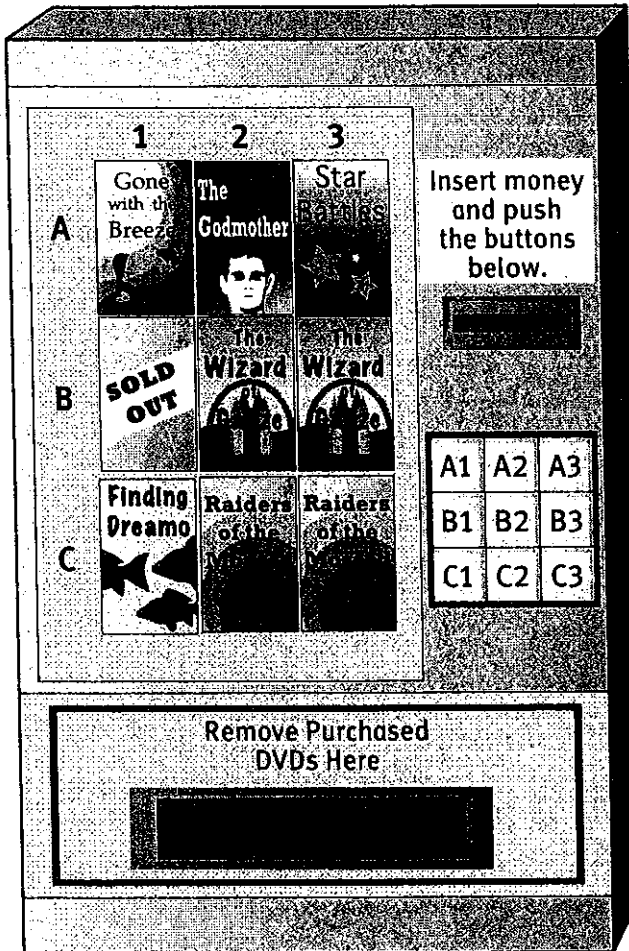
SUGGESTED LEARNING STRATEGIES: Visualizing

ACTIVITY
2.1

My Notes

Use this machine to answer the questions on the next page.

DVD Vending Machine



ACTIVITY 2.1*continued***Introduction to Functions****Vending Machines****NG STRATEGIES: Activating Prior**

My Notes

1. Suppose you inserted your money and pressed A1. What item would you receive?
2. Suppose you inserted your money and pressed C2. What item would you receive?
3. Suppose you inserted your money and pressed B3. What item would you receive?
4. If the machine were filled properly, what would happen if you pressed any of those same buttons again?

Each time you press a button, an **input**, you may receive a DVD, an **output**.

5. In the DVD vending machine situation, does every input have an output? Explain your response.
6. Each combination of input and output can be expressed as a **mapping** written *input* \rightarrow *output*. For example, B2 \rightarrow Wizard of Gauze]
 - a. Write as mappings each of the possible combinations of buttons pushed and DVDs received in the vending machine.

MATH TERMS

A **mapping** is a visual representation of a relation in which an arrow associates each input with its output.

CONNECT TO AP

When conducting observational studies in AP Statistics, the data collected are not always numerical. For example, a study might compare the fruit-juice flavor preferred by male students compared with the flavor preferred by female students.

Introduction to Functions

Vending Machines

ACTIVITY 2.1

continued

SUGGESTED LEARNING STRATEGIES: Linking Concepts, Note Taking, Create Representations

- b. Mappings relating values in one set of numbers to another set of numbers can be written as **ordered pairs**. Write the following numerical mappings as ordered pairs.

Input		Output	Ordered Pairs
1	→	-2	(1, -2)
2	→	1	
3	→	4	
4	→	7	

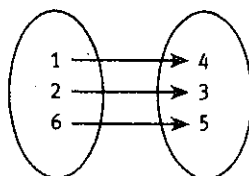
A **relation** is a set of ordered pairs. The list of ordered pairs that you wrote in Item 6(b) is a relation.

Relations can have a variety of representations. Consider the relation $\{(1, 4), (2, 3), (6, 5)\}$, shown here as a set of ordered pairs. This relation can also be represented in these ways.

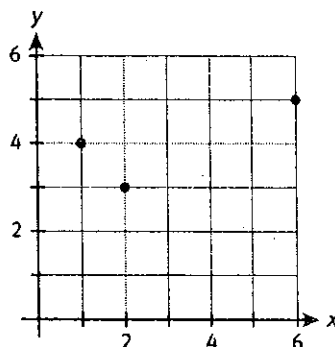
Table

x	y
1	4
2	3
6	5

Mapping



Graph



7. You represented the vending machine situation using mappings in Item 6. Other representations can also be used to illustrate how the inputs and outputs of the vending machine are related.

- Create a table to illustrate how the inputs and outputs of the vending machine are related.
- In representing the vending machine inputs and outputs, what decisions would need to be made to create the graph?

My Notes

MATH TERMS

An **ordered pair** shows the relationship between two elements, written in a specific order using parentheses notation and a comma separating the two values.

MATH TERMS

relation

ACTIVITY 2.1**Introduction to Functions***continued***Vending Machines****NG STRATEGIES: Group Presentation,**

My Notes

ACADEMIC VOCABULARY

function

A **function** is a relation in which each input is paired with exactly one output.

8. Compare and contrast the DVD Vending Machine with a function.

9. Suppose when pressing button C1 button on the vending machine both "Finding Dreamo" and "Raiders of the Mossed Bark" come out. How does this vending machine resemble or not resemble a function?

10. Imagine a machine where you input an age and the machine gives you the name of anyone who is that age. Compare and contrast this machine with a function. Explain by using examples and create a representation of the situation.

11. Create an example of a situation (math or real-life) that behaves like a function and another that does not behave like a function. Explain why you chose each example to fit the category.

a. Behaves like a function:

b. Does not behave like a function: